JEFFREY J. HARD

National Marine Fisheries Service
Northwest Fisheries Science Center
Conservation Biology Division
2725 Montlake Boulevard East
Seattle, Washington 98112
Tel: (206) 860-3275
Fax: (206) 860-3335
E-mail: jeff.hard@noaa.gov

RESEARCH INTERESTS

Evolution of life histories
Quantitative genetics
Conservation biology
Genetic and ecological consequences of captive propagation
Experimental design and statistical analysis

EDUCATION

1991	Ph.D. Ecology and Evolutionary Biology, University of Oregon, Eugene
1984	M.S. Fisheries, University of Alaska, Juneau
1979	B.S. Biology, Oregon State University, Corvallis

EXPERIENCE

1997-	Population Biology Program Manager, Conservation Biology Division, Northwest Fisheries Science Center, Seattle, Washington
2002	Supervisory Research Fishery Biologist and Acting Director, Conservation Biology Division, Northwest Fisheries Science Center, Seattle, Washington
1992-	Research Fishery Biologist, U.S. Department of Commerce, NMFS, Northwest Fisheries Science Center, Seattle, Washington
1986-91	Graduate Research Fellow, Department of Biology, University of Oregon, Eugene
1982-86	Fishery Biologist, U.S. Department of Commerce, NMFS, Auke Bay Laboratory and Little Port Walter Field Station, Alaska
1977-82	Fishery Technician, U.S. Department of Commerce, NMFS, Auke Bay Laboratory and Little Port Walter Field Station, Alaska
1975-76	Research Assistant, Institute of Marine Science, University of Alaska, Fairbanks, Alaska, and CEPEX (Controlled Ecosystem Pollution EXperiment) Project, Patricia Bay Laboratory, Sidney, B.C., Canada

PUBLICATIONS

Refereed Research Papers

1. McClelland, E. K., J. M. Myers, J. J. Hard, L. K. Park, and K. A. Naish. 2005. Two generations of outbreeding in coho salmon (*Oncorhynchus kisutch*): effects on size and growth. Canadian Journal of Fisheries and Aquatic Sciences, *in press.*

2. Smoker, W. W., I. A. Wang, A. J. Gharrett, and J. J. Hard. 2004. Embryo survival and smolt to adult survival in second-generation outbred coho salmon. Journal of Fish Biology 65 (Suppl. A):254-262.

3. Thrower, F. P., J. J. Hard, and J. E. Joyce. 2004. Genetic architecture of growth and early life history transitions in anadromous and derived freshwater populations of steelhead (*Oncorhynchus mykiss*). Journal of Fish Biology 65 (Suppl. A):286-307.

4. Granath, K. L., W. W. Smoker, A. J. Gharrett, and J. J. Hard. 2004. Effects on embryo development time and survival of intercrossing three geographically separate populations of southeast Alaska coho salmon (Oncorhynchus kisutch). Environmental Biology of Fishes 69:299-306.

5. Waples, R. S., R. G. Gustafson, L. A. Weitkamp, J. M. Myers, O. W. Johnson, P. J. Busby, J. J. Hard, G. J. Bryant, F. W. Waknitz, K. Neely, D. Teel, W. S. Grant, G. A. Winans, S. Phelps, A. Marshall, and B. M. Baker. 2001. Characterizing diversity in Pacific salmon from the Pacific Northwest. Journal of Fish Biology 59(a):1-41.

6. Hard, J. J., L. Connell, W. K. Hershberger, and L. W. Harrell. 2000. Genetic variation in mortality of chinook salmon (*Oncorhynchus tshawytscha*) during a bloom of the marine alga *Heterosigma akashiwo.* Journal of Fish Biology 56:1387-1397.

7. Hard, J. J., B. A. Berejikian, E. P. Tezak, S. L. Schroder, C. M. Knudsen, and L. T. Parker. 2000. Evidence for morphometric differentiation of wild and captively reared coho salmon: a geometric analysis. Environmental Biology of Fishes 58(1):61-73.

8. Hard, J. J., G. A. Winans, and J. C. Richardson. 1999. Phenotypic and genetic architecture of juvenile morphometry in chinook salmon. Journal of Heredity 90(6):597-606.

9. Hard, J. J., and W. R. Heard. 1999. Analysis of straying variation in Alaskan hatchery chinook salmon following transplantation. Canadian Journal of Fisheries and Aquatic Sciences 56:578-589.

10. Berejikian, B. A., E. P. Tezak, S. L. Schroder, C. M. Knudsen, and J. J. Hard. 1997. Reproductive behavioral interactions between wild and captively reared coho salmon (*Oncorhynchus kisutch*). ICES Journal of Marine Science 54:1040-1050.

11. Bradshaw, W. E., C. M. Holzapfel, C. A. Kleckner, and J. J. Hard. 1997. Heritability of development time and protandry in the pitcher-plant mosquito, *Wyeomyia smithii*. Ecology 78:969-976.

12. Hard, J. J. 1995. Science, education, and the fisheries scientist. Fisheries 20(3):10-16.

13. Hard, J. J., W. E. Bradshaw, and C. M. Holzapfel. 1993. Genetic coordination of demography and phenology in the pitcher-plant mosquito, *Wyeomyia smithii*. Journal of Evolutionary Biology 6:707-723.

14. Hard, J. J., W. E. Bradshaw, and C. M. Holzapfel. 1993. The genetic basis of photoperiodism and its divergence among populations of the pitcher-plant mosquito, *Wyeomyia smithii*. The American Naturalist 142(3):457-473.

15. Hard, J. J., and W. E. Bradshaw. 1993. Reproductive allocation in the western tree-hole mosquito, *Aedes sierrensis*. Oikos 66(1):55-65.

16. Hard, J. J., W. E. Bradshaw, and C. M. Holzapfel. 1992. Epistasis and the divergence of photoperiodism between populations of the pitcher-plant mosquito, *Wyeomyia smithii*. Genetics 131:389-396.

17. Courtney, S. P., and J. J. Hard. 1990. Host acceptance and life-history traits in *Drosophila busckii*: tests of the hierarchy-threshold model. Heredity 64(1990):371-375.

18. Hard, J. J., W. E. Bradshaw, and D. J. Malarkey. 1989. Resource- and density-dependent development in tree-hole mosquitoes. Oikos 54(2):137-144.

19. Hard, J. J., A. C. Wertheimer, and W. F. Johnson. 1989. Geographic variation in the occurrence of red- and white-fleshed chinook salmon (*Oncorhynchus tshawytscha*) in western North America. Canadian Journal of Fisheries and Aquatic Sciences 46(7):1107-1113.

20. Hard, J. J. 1986. Production and yield of juvenile chinook salmon in two Alaskan lakes. Transactions of the American Fisheries Society 115(2):305-313.

21. Hard, J. J., A. C. Wertheimer, W. R. Heard, and R. M. Martin. 1985. Early male maturity in two stocks of chinook salmon (*Oncorhynchus tshawytscha*) transplanted to an experimental hatchery in southeastern Alaska. Aquaculture 48(1985):351-359.

Refereed Book Chapters and Review Papers

1. Hard, J. J. 2005. Case study of Pacific salmon. *In* U. Dieckmann, O. R. Godø, M. Heino, and J. Mork (editors), Fisheries-Induced Adaptive Change. Cambridge Studies in Adaptive Dynamics, Cambridge University Press, *in press*.

2. Hard, J. J. 2004. Evolution of chinook salmon life history under size-selective harvest. *In* A. Hendry and S. Stearns (editors), Evolution Illuminated: Salmon and Their Relatives, p. 315-337, Oxford University Press.

3. Wang, S., J. J. Hard, and F. Utter. 2002. Salmonid inbreeding: a review. Reviews in Fish Biology and Fisheries 11:301-319.

4. Wang, S., J. J. Hard, and F. Utter. 2002. Genetic variation and fitness in salmonids. Conservation Genetics 3:321-333.

5. Hard, J. J., R. G. Kope, and W. S. Grant. 2000. Endangered Species Act review of the status of pink salmon from Washington, Oregon, and California. *In* E. E. Knudsen, C. R. Steward, D. D. MacDonald, J. E. Williams, and D. W. Reiser (editors), Sustainable Fisheries Management: Pacific Salmon, p. 103-110, Lewis Publishers, Boca Raton, FL.

6. Hard, J. J. 1995. A quantitative genetic perspective on the conservation of intraspecific diversity. American Fisheries Society Symposium 17:304-326.

7. Hard, J. J. 1995. Genetic monitoring of life-history characters in salmon supplementation: problems and opportunities. American Fisheries Society Symposium 15:212-225.

8. Hard, J. J. 1987. All the kings' colors. Alaska Fish & Game 19(4):4-5.

Conference Proceedings

1. Hard, J. J. 2002. Genetic risks of hatchery salmon production to wild salmon. *In* C. Orr, P. Gallaugher, and J. Penikett (editors), Hatcheries and the protection of wild salmon, p. 72-85. Speaking for the Salmon workshop proceedings, Centre for Coastal Studies and Continuing Studies in Science at Simon Fraser University, Burnaby, B.C.

2. Hard, J. J. 2002. Update on the status of pink salmon in the Pacific Northwest. *In* K. Neely, O. W. Johnson, K. W. Myers, and J. J. Hard (rapporteurs), Proceedings 20th Northeast Pacific Pink and Chum Workshop, Seattle, Washington.

3. Neely, K., O. W. Johnson, K. W. Myers, and J. J. Hard (rapporteurs). 2002. Proceedings 20th Northeast Pacific Pink and Chum Workshop, Seattle, Washington.

4. Johnson, O. W., A. M. Garrett, W. S. Grant, K. Neely, M. H. Ruckelshaus, F. W. Waknitz, and J. J. Hard. 2001. Summary of status review of coastal cutthroat trout from the Pacific northwest. Pages 255-257 in Brewin, M. K., A. J. Paul, and M. Monita (editors). Bull trout II conference proceedings. Trout Unlimited Canada, Calgary, Alberta.

5. Hard, J. J. 2000. Genetic interactions between wild and cultured salmon. *In* P. Gallaugher and C. Orr (editors), Aquaculture and the protection of wild salmon, p. 8-18. Speaking for the Salmon workshop proceedings, Continuing Studies in Science at Simon Fraser University, Burnaby, B.C.

6. Hard, J. J. 1999. Status review of pink salmon in the Pacific Northwest. *In* S. Hawkins (rapporteur), Proceedings of the 19th Northeast Pacific Pink and Chum Salmon Workshop, p. 166-173, Juneau, Alaska.

Technical reports

1. Hard, J. J., and K. A. Naish. 2005. Evaluate effects of inbreeding and inbreeding depression. In B. A. Berejikian (editor), Research on captive broodstock programs for Pacific salmon, p. xx-xx. Annual Report to Bonneville Power Administration, Project No. 93-056-00 (Contract No. 00005227).

2. Hard, J. J., and K. A. Naish. 2004. Evaluate effects of inbreeding and inbreeding depression. In B. A. Berejikian (editor), Research on captive broodstock programs for Pacific salmon, p. 164-189. Annual Report to Bonneville Power Administration, Project No. 93-056-00 (Contract No. 00005227).

2. Peek, J. M., M. S. Boyce, E. O. Garton, J. J. Hard, and L. S. Mills. 2002. Risks involved in current management of elk in Washington. Final report to Washington Department of Fish and Wildlife and Washington Wildlife Commission, Olympia, WA, 99 p. October 2002.

3. Hard, J. J. 2002. Inbreeding. In B. A. Berejikian (editor), Research on captive broodstock programs for Pacific salmon, p. 96-110. Annual Report to Bonneville Power Administration, Project No. 93-056-00 (Contract No. 00005227).

4. Fuss, H. J., C. Sharpe, M. J. Ford, J. J. Hard, and E. LaHood. 2001. Differences in natural production between hatchery and wild coho salmon in Minter Creek, Washington. Annual Report to the Hatchery Scientific Research Group, Seattle, WA, June 2001.

5. Hard, J. J. 2001. Inbreeding. In B. Berejikian and C. Nash (editors), Research on captive broodstock programs for Pacific salmon, p. 86-94. Annual Report to Bonneville Power Administration, Project No. 93-056-00 (Contract No. 00005227).

6. Hard, J. J. 2000. Inbreeding. Pages 111-116 *In* B. Berejikian (editor), Research on captive broodstock programs for Pacific salmon. Report to Bonneville Power Administration, Contract No. 1999A117859, Project No. 199305600, 124 electronic pages (BPA Report DOE/BP-17859-1), June 2000. (Available http://www.efw.bpa.gov/Environment/EW/EWP/DOCS/REPORTS/HATCHERY/A17859-1.pdf)

7. Ford, M. J., and J. J. Hard. 2000. Does traditional hatchery production help conserve wild salmon – a comment on the Fall Creek coho hatchery controversy. Unpubl. manuscript, 9 p., available as an Adobe Acrobat file from http://www.nwfsc.noaa.gov/cbd/LannanResponse.pdf.

8. Johnson, O. J., M. H. Ruckelshaus, W. S. Grant, F. W. Waknitz, A. M. Garrett, G. J. Bryant, K. M. Neely, and J. J. Hard. 1999. Status review of coastal cutthroat trout from Washington, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-37, 292 p.

9. Hard, J. J. 1997. Genetic effects of salmon hatcheries: outbreeding depression, artificial selection, and fitness. *In* Proceedings of Outbreeding Depression: A Research Planning Workshop. University of Alaska, Juneau, 2-5 March.

10. Hard, J. J., R. G. Kope, W. S. Grant, F. W. Waknitz, L. T. Parker, and R. S. Waples. 1996. Status review of pink salmon from Washington, Oregon, and California. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-25, 131 p.

11. Hard, J. J., and W. K. Hershberger. 1996. Research on quantitative genetic consequences of captive broodstock programs for Pacific salmon populations. In P. Swanson and 8 coauthors: Research on captive broodstock programs for Pacific salmon, Part VIII, p. 8-1 to 8-28. Annual report to Bonneville Power Administration, Contract No. AI79-93BP55064, Proj. No. 93-56.

12. Hard, J. J., and W. K. Hershberger. 1995. Quantitative genetic consequences of captive broodstock programs for anadromous Pacific salmon (*Oncorhynchus* spp.). *In* T. A. Flagg and C. V. W. Mahnken (editors), An assessment of the status of captive broodstock technology for Pacific salmon, p. 2-1 to 2-75. Final Report to Bonneville Power Administration, Project No. 93-56 (Contract No. DE-AI79-93BP55064), June 1995.

13. Hard, J. J. 1994. Genetics and salmon management: expanded summary of a panel discussion. *In* L. K. Park, P. Moran, and R. S. Waples (editors), Applications of DNA technology to the management of Pacific salmon: proceedings of the workshop, p. 151-163. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-17, 178 p.

14. Hard, J. J. 1994. Density dependence, ecological carrying capacity, and Pacific salmon: a summary report. Memorandum to NMFS Northwest Regional Office from NMFS Northwest Fisheries Science Center, Seattle, Washington.

15. National Marine Fisheries Service (NMFS). 1993. Interim policy on artificial propagation of Pacific salmon under the Endangered Species Act. Federal Register [Docket No. 921186-2286; April 5, 1993] 58(63): 17573-17576

16. Hard, J. J., R. P. Jones, Jr., M. R. Delarm, and R. S. Waples. 1992. Pacific salmon and artificial propagation under the Endangered Species Act. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-2, 56 p.

17. Hard, J. J. 1991. Life-history evolution in the pitcher-plant mosquito, *Wyeomyia smithii*. Doctoral dissertation, University of Oregon, Eugene, 100 p.

18. Hard, J. J. 1986. Flesh color variation in chinook salmon (*Oncorhynchus tshawytscha*) at Little Port Walter, southeastern Alaska. U.S. Department of Commerce, NOAA Technical Memorandum NMFS F/NWC-109, 30 p.

Manuscripts in preparation or review

1. Hard, J. J., L. S. Mills, and J. M. Peek. Genetic implications of reduced survival of male red deer. Wildlife Biology, accepted pending revision.

2. Hard, J. J., D. G. Elliott, R. G. Pascho, D. M. Chase, L. K. Park, J. R. Winton, and D. E. Campton. Genetic variation in disease resistance of chinook salmon (*Oncorhynchus tshawytscha*) exposed to two bacterial pathogens. Submitted to Canadian Journal of Fisheries and Aquatic Sciences.

3. Spruell, P., F. Utter, M. McClure, J. Hard, N. Ryman, and K. Naish. Reply to Brannon et al. To be submitted to Fisheries.

4. Hard, J. J., J. E. Joyce, F. P. Thrower, and A. C. Wertheimer. Analysis of age and size at maturity in southeastern Alaska chinook salmon under selective harvest. To be submitted to Canadian Journal of Fisheries and Aquatic Sciences.

5. Hard, J. J., W. K. Hershberger, L. T. Parker, K. Neely, and S. Wang. Consequences of inbreeding in chinook salmon, *Oncorhynchus tshawytscha*. To be submitted to Aquaculture.

PAPERS GIVEN AT CONFERENCE AND SYMPOSIA (most recent 5 years)

Invited

1. 2005 Differentiation of wild Alaskan anadromous and derived freshwater populations of *Oncorhynchus mykiss* in neutral and adaptive traits: implications for conservation and recovery of steelhead. Annual meeting of the American Fisheries Society, Anchorage, Alaska, 11-15 September
2. 2004 Evaluating the potential for fisheries-induced evolutionary change in salmonids. Annual meeting of the American Fisheries Society, Madison, Wisconsin, 21-26 August
3. 2004 Potential outbreeding depression between an anadromous population of steelhead (*Oncorhynchus mykiss*) and an outplanted population partially isolated for 70 years and subjected to founder effects. Annual meeting of the American Fisheries Society, Madison, Wisconsin, 21-26 August (with F. P. Thrower and J. E. Joyce)
4. 2004 Quantitative genetics and conservation: applying a proven tool to emerging problems. Plenary address, workshop on Conservation Genetics Workshop on Imperiled Freshwater Molluscs and Fishes, Freshwater Mollusc Conservation Society, Shepherdstown, West Virginia, June
5. 2002 Constraint and opportunity: the complex role genetic architecture plays in adaptation. Keynote address, symposium on Genetic Basis, Architecture, and Determinants of Fitness-related Traits in Fishes, Congress on Ecological and Evolutionary Ethology of Fishes, Quebec City, Quebec, Canada, 16-19 August
6. 2002 Inbreeding and its consequences: what do we know and need to know? Workshop on Captive Broodstocks for Recovery of Imperiled Salmonid Populations, Gig Harbor, Washington, 25-26 June
7. 2002 Evaluating benefits and risks of hatchery salmon production: why the controversy? Salmonid Restoration Conference, Ukiah, California, 2-3 March
8. 2001 Some current issues related to the culture of Pacific salmon for enhancement. Cultivation of Salmon II Symposium, Bergen, Norway, 6-10 May (with K. D. Shearer, M. Strom, and W. Fairgreave)
9. 2001 Update on the status of pink salmon in the Pacific Northwest. 20th Northeast Pacific Pink and Chum Workshop, Seattle, Washington, 21-23 March
10. 2001 Evolution of salmon life history under size-selective harvest. Symposium on Fisheries-Induced Adaptive Change, International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria, 14-17 March
11. 2000 Defining units of salmon conservation: the challenge of interpreting biological diversity. Symposium on Evolutionary Ecology of Pacific Salmon (S-8), Society for Conservation Biology, Missoula, Montana, 5-9 June (with P. J. Busby, R. G. Gustafson, O. W. Johnson, J. M. Myers, and L. A. Weitkamp)
12. 2000 Consequences of inbreeding for survival and growth of captively reared chinook salmon: preliminary results. Fish and Fisheries in the Columbia River Basin: The Science Behind the Decisions, Annual Meeting of Oregon Chapter, American Fisheries Society, Eugene, Oregon, 16-18 February

Contributed

13. 2004 Heritability of precocious maturation, smolting and growth in anadromous and derived freshwater populations of steelhead (*Oncorhynchus mykiss*). Annual international conference of the Fisheries Society of the British Isles, London, 19-23 July (with F. P. Smoker and J. E. Joyce)
14. 2004 No effect on embryo survival or smolt to adult survival at sea in second generation of outbreeding of coho salmon. Annual international conference of the Fisheries Society of the British Isles, London, 19-23 July (with W. W. Smoker, I. A. Wang, and A. J. Gharrett)

15. 2004 Quantitative genetic analysis of chinook salmon resistance to two bacterial pathogens. Coastwide Genetics Workshop, Newport, Oregon, 17-18 June (poster with L. Park, R. Pascho, D. Elliott, D. Chase, and D. Campton)
16. 2003 Inheritance of age at maturity in Alaskan chinook salmon under size-selective harvest. Annual meeting of the American Fisheries Society, Quebec City, Quebec, Canada, 10-14 August
17. 2002 Consequences of size-selective fishing for evolution of chinook salmon life history. 20th Lowell Wakefield Fisheries Symposium on Genetics of Subpolar fish and Invertebrates, Juneau, Alaska, 29-31 May
18. 2002 Effects on embryo development time and survival of intercrossing three geographically separate stocks of southeast Alaska coho salmon (*Oncorhynchus kisutch*). 20th Lowell Wakefield Fisheries Symposium on Genetics of Subpolar fish and Invertebrates, Juneau, Alaska, 29-31 May (with K. L. Granath, W. W. Smoker, and A. J. Gharrett)
19. 2002 Relative fitness of hatchery and natural coho salmon spawning in Minter Creek, Washington. 20th Lowell Wakefield Fisheries Symposium on Genetics of Subpolar fish and Invertebrates, Juneau, Alaska, 29-31 May (with M. Ford, E. LaHood, B. Berejikian, H. Fuss, C. Sharpe, and P. Hulett)

PAPERS GIVEN AT SEMINARS AND WORKSHOPS (most recent 5 years)

Invited

1. 2004 Genetic variation in life history in anadromous and derived freshwater forms of *Oncorhynchus mykiss*, Independent Scientific Advisory Board, Seattle, Washington, 8 December
2. 2004 Genetic variation in life history in anadromous and derived freshwater forms of *Oncorhynchus mykiss*, Recovery Science Review Panel, Santa Cruz, California, 1 December
3. 2004 An evolutionary look at size-selective harvest of chinook salmon, Independent Scientific Advisory Board Seattle, Washington, 25 February
4. 2004 Consequences of interbreeding among coho salmon populations: preliminary results, Hatchery Scientific Research Group, Seattle, Washington, 9 February
5. 2004 An evolutionary look at size-selective harvest of chinook salmon, University of Washington, School of Fishery and Aquatic Sciences, Seattle, Washington, 5 February
6. 2003 Genetics issues in hatcheries and captive breeding programs, University of Washington, School of Fishery and Aquatic Sciences, Seattle, Washington, 26 November
7. 2003 Collaborative development of a CALFED proposal to reprogram California salmon production hatcheries for research, Sacramento, California, 27 March
8. 2002 Genetics issues in hatcheries and captive breeding programs, University of Washington, School of Fishery and Aquatic Sciences, Conservation Genetics 510 lecture, Seattle, Washington, 27 November
9. 2001 Genetic consequences of elk harvest. Elk Risk Assessment Panel - Progress Report. Washington Fish and Wildlife Commission Workshop, Olympia, Washington, 6 October
10. 2001 Genetic risks of hatchery salmon production to wild salmon, Hatcheries and the Protection of Wild Salmon , Simon Fraser University Centre for Coastal Studies, Burnaby, B.C., Canada, 6-8 June
11. 2001 Quantitative genetics of salmon harvest, University of Washington, School of Fishery and Aquatic Sciences, Conservation Genetics 510 lecture, Seattle, Washington, 21 May
12. 2001 Evolutionary consequences of size-selective harvest for chinook salmon, University of Alaska Fairbanks, School of Fishery and Ocean Sciences, Juneau, Alaska, April
13. 2001 Defining units of salmon conservation: the challenge of interpreting biological diversity, University of Alaska Fairbanks, School of Fishery and Ocean Sciences, Juneau, Alaska, April
14. 2000 Workshop for Recovery and Restoration of East Coast Sturgeons in the Neuse and St. John's River Systems, National Ocean Service Charleston Laboratory, Ft. Johnson, South Carolina, 26-27 July
15. 2000 Sturgeon Culture Risk Assessment Workshop, Mote Marine Laboratory, Sarasota, Florida, 6-7 April
16. 2000 Genetic interactions between wild and cultured salmon, Aquaculture and the Protection of Wild Salmon , Simon Fraser University Continuing Studies in Science, Burnaby, B.C., Canada, 1-3 March

Contributed

17. 2002 Hatchery Research in Conservation Biology Division. Presentation to NWFSC Accreditation Panel, Northwest Fisheries Science Center, Seattle, Washington, 16 September
18. 2002 Relative fitness of hatchery and natural coho salmon in Minter Creek - Progress report. Hatchery Scientific Research Group, Northwest Fisheries Science Center, Seattle, Washington, 16 January

RESEARCH FUNDING

2000- Heritability of Disease Resistance and Immune Function in Chinook Salmon, Bonneville Power Administration FY-2000 Initiative, $200K awarded (D. E. Campton, USFWS; D. G. Elliott and R. J. Pascho, USGS, co-P.I.s)

2000- Differences in Natural Production Between Hatchery and Wild Coho: Reproductive Competence as Influenced by Degree of Hatchery Ancestry, Hatchery Scientific Review Group, Interagency Committee for Outdoor Recreation, $340K awarded (H. J. Fuss, P. L. Hulett, and C. S. Sharpe, WDFW; K. P. Currens, NWIFC; and M. J. Ford, NWFSC, co-P.I.s)

1996- Outbreeding Depression in Pacific Salmon, NOAA/NMFS Recover Protected Species Initiative, Project NWC-P18, $1.20M awarded

1993- Quantitative Genetic Consequences of Captive Broodstock Programs for Pacific Salmon, Bonneville Power Administration, Project 93-56, $1.57M awarded (K. A. Naish, University of Washington, co-P.I.)

AWARDS, HONORS, AND FELLOWSHIPS

2000-02 U.S. Department of Commerce Special Act Awards
1996 U.S. Department of Commerce Group Bronze Medal, Endangered Species Act Coastwide Status Reviews for Pacific Salmon
1996 U.S. Department of Commerce Group Bronze Medal, Genetics Project
1993 Finalist, Young Investigator's Prize, Society of American Naturalists
1992 National Research Council Post-doctoral Fellowship (award offered)
1990-91 National Institutes of Health Genetics Training Grant (pre-doctoral fellowship)
1987-88 Coca-Cola Scholarship, University of Oregon
1986-91 Graduate Fellowship, University of Oregon
1986 Finalist, American Fisheries Society Publications Awards for Best Publication in the Transactions of the American Fisheries Society
1981-84 U.S. Department of Commerce Advanced Studies Program
1974-76 Alaska Stateroom Scholarship, University of Alaska

PROFESSIONAL AFFILIATIONS AND CERTIFICATIONS

2005- Mentor, NMFS - Sea Grant Joint Graduate Fellowship Program in Population Dynamics and Marine Resource Economics
2000- National Research Council Post-doctoral Research Advisor
1998- Affiliate Associate Professor of Fisheries, University of Alaska Fairbanks, School of Fisheries and Ocean Sciences
1996- American Association for the Advancement of Science, Member
1989- Sigma Xi: The Scientific Research Society, Associate
1984- American Institute of Fishery Research Biologists, Member
1982- American Fisheries Society (Certified Fisheries Scientist, 1986; President, Genetics Section, 2004-)

PROFESSIONAL ACTIVITIES

2005 Co-lead, Endangered Species Act status review for Puget Sound steelhead
2004-06 President, Genetics Section, American Fisheries Society

2004 Member, Scientific Panel, Battle Creek Steelhead Supplementation Plan
2004 Advisory Group, Risk Assessment Modeling Project for Salmon Hatcheries
2003- Associate Editor, *Transactions of the American Fisheries Society*
2003- Member, Oregon Hatchery Research Center Science Team and Advisory Board
2001-02 Member, Review Panel for Elk Harvest Strategies, Washington Department of Fish and Wildlife and Washington Wildlife Commission
2001 Co-chair, 20th Northeast Pacific Pink and Chum Salmon Workshop, Seattle, Washington
2000 Panelist, Aquaculture and the Protection of Wild Salmon 'Think Tank,' Simon Fraser University Continuing Studies in Science, Burnaby, B.C., Canada
1997 Alaska Sea Grant Annual Review Panelist
1995 Genetics Panelist, Wild Salmon Supplementation Workshop, *Exxon Valdez* Oil Spill Restoration Program
1994-96 Lead researcher, Endangered Species Act status review for pink salmon
1994 Expert Panelist, Canadian Salmonid Enhancement Program Evaluation
1994- Chinook Salmon Captive Propagation Technical Oversight Committee
1991 Steering Committee, Twelfth Pacific Ecology Conference
1990-91 President's Task Force on Research and Graduate Education, University of Oregon

STUDENT SUPERVISION

2005- Jessica Dales, Santa Clara University NOAA undergraduate intern, Environmental Sciences major
2005- Tyler Dann, University of Alaska School of Fisheries and Ocean Sciences (M.S. Advisory committee)
2005- Jon Drake, University of Washington School of Forest Sciences (Ph.D. Advisory committee, Advanced Studies Program)
2004- Willy Eldridge, University of Washington School of Aquatic and Fishery Sciences (Ph.D. Advisory committee); NMFS - Sea Grant Joint Graduate Fellow in Population Dynamics and Marine Resource Economics
2003-05 Dr. Shaun Roark (Ph.D. Miami University, Ohio), NRC Postdoctoral Associate
2002-05 Kathleen Neely, University of Washington School of Aquatic and Fishery Sciences (M.S. Advisory committee, Advanced Studies Program)
2002-05 Stephanie Walden, University of Alaska School of Fisheries and Ocean Sciences (M.S. Advisory committee)
2001-05 Todd Seamons, University of Washington School of Fisheries (Ph.D. advisory committee)
1999-02 Brian Beckman, University of Washington School of Fisheries (Ph.D. advisory committee)
1998-02 Karla Granath, University of Alaska School of Fisheries and Ocean Sciences (M.S. Advisory committee)
1998-01 Dr. Kerry Naish (Ph.D. University of Wales, Swansea), NRC Senior Postdoctoral Associate
1998-01 Shizhen Wang, University of Washington School of Fisheries (Ph.D. advisory committee)
1996-97 Chris Richardson, University of Washington School of Fisheries (undergraduate student; mentoring)

OUTREACH

2004 Graduate course led: Quantitative Genetics (FISH 510), University of Washington School of Aquatic and Fishery Sciences, Seattle, Spring Quarter, March-June
1999 Science Judge, Cedar River Elementary School Science Fair, Tahoma School District, May
1994- University of Oregon Mentor Program
1987-88 Scientist-In-Residence, Eugene 4J School District, Oregon

REVIEWS

Journals

American Fisheries Society Special Symposia, American Naturalist, Canadian Journal of Fisheries and Aquatic Sciences, Canadian Journal of Zoology, Conservation Biology, Conservation Genetics, Copeia, Ecological Applications, Ecology, Ecology of Freshwater Fish, Environmental Biology of Fishes, Evolution, Functional

Ecology, Genetics, Heredity, Journal of Fish Biology, Journal of Heredity, North American Journal of Fisheries Management, Progressive Fish-Culturist, Transactions of the American Fisheries Society

Grant proposals and other documents

Florida Fish and Wildlife Commission Finfish Genetics Policy, Washington Sea Grant and Alaska Sea Grant research proposals, Hatchery Scientific Research Group Operational Guidelines, Aquaculture Collaborative Research and Development Program (Canada), U.S. Department of Agriculture Small Business Innovation Research Program, Saltonstall-Kennedy Grant research proposals, Aquanet (Canada), Natural Sciences and Engineering Research Council of Canada (NSERC), USGS Gila Trout Broodstock Management Plan, NWFSC Internal Grants Program

References available upon request